

A Botanical Excursion to Pulau Adang.

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The group of islands of which Pulau Adang is the largest lies to the west of the islands of Lankawi and Terutau. It consists of 3 fairly large island Pulau Adang, Pulau Rawi and Pulau Butong and a number of smaller islets.

The flora of this outlying group had never been investigated and I was glad of the opportunity afforded me by Mr. Robinson to accompany him there in the "Seabelle," in April. Leaving Kuala Lumpur on April 18th, at 5 p.m., we arrived at Penang next morning and starting again in the afternoon reached the islands on April 20th., about daybreak. The party consisted of Mr. H. C. Robinson, Mr. Seemund, Dr. Hanitsch and myself, with a number of zoological collectors and my botanical collector. We brought a motor-boat and with the aid of this and the ship's gig landed the collecting party on Pulau Rawi. The only signs of human occupation were a few coconut palms and bushes of *Justicia Gandarusa* on the shore. Mr. Robinson and I started through the woods to climb the hill. On the seashore I saw a number of plants of *Geodorum purpureum* but none in flower. The forest proved very poor as a collecting ground, consisting of a number of big trees rather scattered, and an abundance of climbing lianes, chief of which were *Agelaea vestita*, some *Menispermaceae*, a climbing bamboo like one seen at Alor Star, *Calami* and *Korthalsias*. The undergrowth was scanty, a red *Ixora* (*I. stricta*) and other shrubs, *Corymbis veratrifolia*, and *Aspidium polymorphum*. The most striking tree was the tall *Randia exaltata* 30 feet or more high and 9 inches through. It was in flower and we felled one to secure specimens. The flowers are white spotted within the tube with black. It occurs also in Penang, Burmah and the Andamans. Returning to the shore we found the littoral vegetation consisting of *Vitex pubescens*, *Terminalia Catappa*, *Barringtonia speciosa* (very big trees with the branches curiously ringed), *Desmodium umbellatum*, *Stemona Curtisii*, etc. The *Barringtonias* bore great quantity of *Drynaria* and a pale pink flowered *Hoya* (*H. parasitica*) grew over the boughs.

Some of the Dyaks returning from collecting brought *Acanthus ilicifolius*, *Eulophia Keithii* and *Saccolabium miserum* with its little inconspicuous yellow and white flowers.

In the afternoon we went in the motor-boat to a bay in the eastern part of the same island. Here the steep rocks were covered with scented species of *Andropogon* which however was flowerless and only bore in place of flowers small branches of reduced leaves. Plants brought to Singapore and grown there have done the same.

A pretty slender bamboo of a new species abounded here, and flowering specimens were obtained later. *Dillenia aurea*, Sm., was in flower but as usual at that time nearly leafless. In the evening we went ashore at Pulau Butong and found *Prismatomeris albidiflora* in full flower, a beautiful little shrub *Memecylon* with charming little blue flowers and a *Bombax*, quite a small tree, in fruit. *Cordia subcordata* is abundant on the seashore here.

21st April:—We went to the bay we were in at Pulau Rawi yesterday and followed the stream up nearly to its source, pushing through the low swampy woods or wading along the stream bed. There is a patch of mangrove in the river mouth. *Oncosperma filamentosa* and a large species of *Pinanga* forming big clumps (*P. adangensis*) are abundant in the low swampy woods.

The river sandy, at the mouth becomes rocky higher up with large masses of hornblende, granite and sandstone. The flora of these rocks is rather poor considering the altitude we got to. A dwarf *Ophiorrhiza*, *Begonia sinuata*, *Podochilus lucescens* are the most noticeable plants.

The "Seabelle" moved from her anchorage in Rawi bay and picked us up at 2 o'clock and we moved on to Pulau Adang where we went on shore in a beautiful bay with a large sized stream entering it. A very big *Dracaena* about fifty feet tall and much branched with erect branches occurred here and was in fruit. It appeared to be a very large state of *Dracaena aurantiaca*, Wall., but I never before saw one so large. A single tree of *Casuarina equisetifolia* grew in this bay, and we found seedlings in Rawi bay. The tree was very abundant at the east end of the island forming a regular wood, and also on the opposite island of Pulau Nipis. These trees have a habit of growing so regularly spaced that they often quite look as if they had been planted. The sand beneath is almost bare of vegetation. From the distance of the Rawi seedlings from any adult tree and their position I am inclined to think that this plant owes its dispersal more to the sea currents than to the wind in spite of its winged seeds.

22nd April:—Mat and I with a boatman pushed up the stream which is rocky, here and there high walls of rock, and on a big rock near the top found a *Begonia* new to me with flowers, and *Arisaema Kuustleri*, and *Vitis discolor* and eventually reached the top of the ridge. Here were many plants of a species of *Daemonorops* none of which showed any signs of having ever flowered, but seemed to propagate themselves by layering their branches, giving us an opportunity of getting reversed rattan walking sticks. These when made up are very puzzling to those who do not know how they are produced, as the leaf sheaths point to the roots instead of away from them. The branches layer and produce a more or less clubbed end and by cutting the stem between one rooting portion and the next one can obtain a rattan in which the leaves appear to have grown towards the root instead of away from it. The top of the ridge was dry and barren, about 1,000 feet altitude

above the sea. *Curculigo latifolia*, a few Pandans and a *Hornstedtia* without flowers were the chief plants. A hermit who eats only once a year or on occasions once in three months is believed to reside here. A furious storm of rain with thunder and lightning came on when we were half way down, and we took refuge beneath a rock. On reaching the stream again, we found *Gnetum macrostachyum* in fruit and on pulling it down brought down a spray of a laurineous tree new to me. *Dipterocarpaceae* and *Anonaceae*, some of the former of large size are abundant in the woods.

In the evening we went to Pulau Nipis the point of which is a sandy beach with a wood of *Casuarinas*. Here we found a curious creeping form of *Wedelia biflora* with unusually small heads. *Tournefortia argentea* (new to our flora though a common plant on the shores of many of the Malay islands), *Hernandia pellata* and *Ochrosia* in fruit. None of these at all common in our region. Besides these were *Ipomea pes-caprae*, *Scoerola Koenigii*, *Cassytha filiformis*, *Ischoemum muticum*, *Hibiscus tiliaceus*, *Calophyllum inophyllum* and *Terminalia Catappa*. Behind this seashore-sand was a wood in which were a number of *Ixoras* and *Weberas*, and here we found *Pogonia flabelliformis* in leaf and flower. *Eulophia graminea*, a clump of what appeared to be *Calanthe restita* in a decayed bough on the ground and *Dendrobium secundum*.

Next morning I went to the point of Pulau Adang where the *Casuarina* grove was to look for a sedge which Mr. Robinson had told me of and found it to be *Remirea maritima*. The ground beneath the *Casuarinas* was quite bare and the trees bore no epiphytes. The pretty lizard *Liolepis Bellii* was abundant here. Near this point *Colubrina asiatica* was common and *Capparis micracantha*, in the form of a bush, in fruit.

Returning to the "Seabelle" we steamed for Pulau Tengah, and on the way was two killer-whales *Orca gladiator*, a new mammal to peninsular waters. We reached Pulau Tengah by midday. It consists of two islands separated by a strong running shallow sea current, too deep however to wade. On landing the plant collector and I attempted to scale the main hill of the island, the top of which was clad by a forest of bananas. The forest was dense and consisted mainly of the prickly *Phyllochlamys Wallichii* and strong woody climbers with big trees interspersed. We obtained specimens of the banana which proved to be *Musa Malaccensis*. We returned to the base of the hill and walked along the coast to the north to some very high vertical cliffs. The shore was covered with boulders of laterite, slate and indurated clay. The cliffs seemed to consist entirely of this brown clay hardened into rock; at their base were screes of disintegrated clay, steep and slippery. At the base of the hill we found *Peristrophe tinctoria*, a plant I have never seen elsewhere except as a garden escape, but there were no signs of this place ever having been under cultivation. On the screes we found a new species of *Amorphophallus*, with a creamy

white spadix and a green spathe. *Pleopeltis phymalodes* was very abundant. We did not find this common fern at all in the rest of the Pulau Adang group of islands. It was intensely hot and we returned to the southern shore, finding abundance of fruits of *Gyrocarpus Jacquinii*, a tree not common further south.

After collecting a little along the shore and bathing we returned to the boat and left for Kwala Malacca in the Lankawi islands, arriving off Burau bay in the evening where we anchored for the night. Next day we landed and walked up to the 7 Wells, Telayah Tujoh; a good track leads to this spot. On the way I collected a good many plants of interest, *Elettariopsis pubescens*, *Pteris cretica* the grey-leaved variety, a pretty new species of *Phyllanthus* of the *Reidia* section Ph., and found *Mesua ferrea* in flower.

The seven wells are formed by a stream which descending from the hill behind spreads over a wide space of smooth grey rock. In this are excavated by the water a number of basins, some of which are deep enough to bathe in, and these are the seven wells. The stream then falls over a precipitous slope. The spot is a favourite one for Malay picnics, and the water is supposed to have valuable properties and the men drank some and took bottles home with them, which made them all ill as the water is obviously not fit to drink. The view from this stream is very fine. The rugged range of Gunong Chinchang rises on one side, and on the other are hills clad in dense forest, forming an amphitheatre at the end of which is the deep blue sea. The stream at this point is about 1,000 feet above sea level.

We returned from here to Penang and then to Kuala Lumpur and so home.

The most noticeable part about the flora as a whole was its difference from that of the Lankawi islands especially in the preponderance of Malayan as opposed to southern Siamese plants. Naturally the two groups of islands being so near, there were a number of plants characteristic of the south Siamese flora as laid down in a previous paper, but there were also a number of Malay Peninsula forms, such as *Agelaea*, *Urophyllum*, *Lasianthus*, some of the *Dipterocarpeae* and *Anonaceae*, etc. The flora suggests rather an affinity with the Pulau Song-Song group of islands off the Kedah coast which contains nothing or little of the south Siamese flora. It seems too to have relations with the Andaman islands which are not at all connected with the south Siamese plants but which have a Malayan flora. On the seashores of the Adang group we have a series of plants which are absent almost entirely from the Malay Peninsula, *Ochrosia barbonica*, *Tournefortia argentea*, *Hernandia peltata*, and *Gyrocarpus*. The *Ochrosia* is only known as native in the Peninsula from a specimen said to be collected in Singapore by Wallich. It has never been seen here again. *Tournefortia argentea* has not been seen in our region at all, but occurs in St. Barbe isle south of Singapore and along the Malay isles to the Pacific. *Hernandia peltata* is at least rare on

our coasts. *Cordia subcordata* too is scarce occurring in Pulau Song-Song, the Dindings and from Bintang island to the Pacific. All these seem absent or nearly so from the west coast of the Peninsula, although there are at least some suitable spots for them to grow, and quite absent from the east coast where the locality is more suitable, yet all occur in the Indian region and still more abundantly all over the Malay Archipelago to the Pacific.

DILLENIACEAE.

Tetracera assa, De C.

Pulau Rawi.

Dillenia aurea, Sm.

Pulau Rawi.

ANONACEAE.

Unona dasymaschala, Bl.

Woods, Pulau Tengah.

Goniothalamus macrophyllus, Hook. fil.

Pulau Adang.

Oxymitra glauca, Hook. fil.

Pulau Adang.

Polyalthia parviflora, n. sp.

Small tree, bark black, young parts covered with brown hair. Leaves thin coriaceous glabrous except the midrib, which is scurfy on the back. nerves about 6 pairs inarching well within the margin, 3-4 inches long, $\frac{3}{4}$ -1 $\frac{1}{2}$ inch wide, dark above, pale, shining beneath, petiole $\frac{1}{8}$ inch long hairy. Flowers solitary axillary nearly sessile; pedicel very short hairy. Sepals ovate lanceolate half as long as the petals densely hairy. Petals spreading "white," linear oblong obtuse slightly narrowed to the tip $\frac{1}{8}$ inch long hairy on both surfaces. Stamens very numerous oblong with a broad rounded appendage. Fruit oblong to globose $\frac{3}{8}$ inch long, sessile, hairy at the tip when young.

Pulau Tengah; Lankawi at Kwala Malacca (Curtis 2533).

The foliage somewhat resembles that of *P. Teysmanni*, Miq. The very small hairy flower is very distinctive.

CAPPARIDEAE.

Capparis micracantha, De C.

Seashore, Pulau Tengah and Pulau Adang in fruit.

GUTTIFERAE.

Garcinia, sp.

Pulau Rawi. Big tree in forests.

Calophyllum inophyllum, L.

Pulau Nipis.

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VIOLACEAE.

Alsodeia hispida, n. sp.

Branches hairy, leaves thin herbaceous elliptic acuminate; base cuneate or acuminate, margins serrate, nerves 7 pairs, slender, midrib nerves and reticulations hairy, 6 inches long, $2\frac{1}{2}$ inches wide, petiole $\frac{1}{4}$ inch long hairy. Flowers in short axillary cymes, shorter than the petiole, and sessile with small ovate bracts, all glabrous. Pedicels $\frac{1}{10}$ inch long. Calyx sepals ovate acuminate pubescent, more than half as long as the petals. Petals lanceolate or elliptic, lanceolate ciliate on the edges $\frac{1}{10}$ inch long. Stamens, filament very short, anther cells elliptic, separate, connective, very large ovate acuminate, no other processes. Pistil longer bottle-shaped narrowed upwards, glabrous. Stigma discoid. Disc hairy.

Pulau Adang.

RUTACEAE.

Glycosmis pentaphylla, Correa.

Pulau Rawi.

Glycosmis rupestris, Ridl.

Pulau Tengah and Pulau Adang.

Distribution: Perlis and Kedah.

Atalantia monophylla, Correa.

Pulau Tengah.

SIMARUBACEAE.

Eurycoma longifolia, Jack.

Woods, Pulau Rawi.

OCHNACEAE.

Ochna grandis, Ridl.

Pulau Butong.

Distribution: Perlis.

DIPTEROCARPEAE.

Dipterocarpus Hasseltii, Bl.

In fruit, Pulau Butong.

Dipterocarpus grandiflorus, Blanco.

In fruit, Pulau Butong.

Vatica cinerea, King.

Common medium-sized tree on the seashore.

Pulau Rawi and Pulau Adang.

MALVACEAE.

Bombax malabaricum, De C.

A small tree in fruit. Pulau Adang.

Hibiscus tiliaceus, L.

Pulau Nipis, etc.

STERCULIACEAE.

Helicteres angustifolia, L.

Flowers pink. Dry rocks, Pulau Rawi.

Helicteres hirsuta, Lour.

With the last i Pulau Rawi.

Sterculia laevis, Wall.

Pulau Nipis.

AMPELIDEAE.

Leca sambucina, Wild.

Pulau Rawi.

Vitis discolor, Dalz.

Rocks, Pulau Adang.

RHAMNEAE.

Colubrina asiatica, Brngn.

Seashore, Pulau Adang.

CELASTRINEAE.

Salacia flavescent, Kurz.

Pulau Rawi, woods.

ANACARDIACEAE.

Buchanania acuminata, Turcz.

Pulau Nipis.

CONNARACEAE.

Agelaea vestita, Hook. fil.

Pulau Rawi.

LEGUMINOSAE.

Erythrina, sp.

A tree with large leaves in fruit. Calyx bilobed, lower lobe longer than the upper one. Pod 1 or 2 seeded, with a narrow base, then dilated at the seed-bearing portion and abruptly narrowed to a long point.

Seashore, Pulau Tengah.

Pongamia glabra, Vent.

Pulau Tengah.

Desmodium vestitum, Benth.

A shrub about 6 feet tall with mauve flowers. Pulau Butong.

Previously known only from Malabar and Tenasserim.

Desmodium umbellatum, De C.

Seashore, Pulau Rawi.

Mucuna gigantea, De C.

Pulau Tengah.

Peltophorum ferrugineum, Benth.

Big tree, seashore, Pulau Rawi.

Albizia myriophylla, Benth.

Seashore, Pulau Butong and Pulau Adang.

MELASTOMACEAE.

Melastoma malabathricum, var *appressum*.

Pulau Rawi.

Memecylon coeruleum, Jack.

Sea coasts, Pulau Rawi.

Memecylon garcinoides, Bl.

Pulau Adang.

Memecylon edule, Roxb.

Pulau Adang and Pulau Butong.

Memecylon pulchellum, n. sp.

A shrub or small tree, bark ridged longitudinally brown, twigs angled slender. Leaves rhomboid ovate gradually narrowed to both ends from the middle, obtuse at the apex, shining dull green above when dry; smooth olive green beneath, midrib depressed above, elevate beneath, nerves faintly visible, above 7 pairs, with a marginal one from the base $1\frac{1}{2}$ inch long $\frac{3}{4}$ inch wide, petiole $\frac{1}{10}$ inch long. Flowers in short dense very shortly peduncled cymes. Peduncles $\frac{1}{20}$ inch long. Bracts lanceolate acuminate. Pedicels $\frac{1}{10}$ inch long. Calyx fundus very short in flower with 4 triangular teeth suddenly subulate. Petals ovate cuspidate azure blue $\frac{1}{20}$ inch long. Stamens filaments slender bluish. Anthers curved yellowish with a conic blue spur behind. Style brilliant blue.

Pulau Adang, Rawi and Butong on the seashore. A lovely shrub when in flower with innumerable tufts of blue flowers in the axils.

MYRTACEAE.

Eugenia Scortechinii, King.

By the river, Pulau Rawi.

Barringtonia speciosa, Forst.

Seashore, Pulau Rawi.

RHIZOPHORACEAE.

Bruguiera caryophylloides, Bl.

Pulau Butong.

COMBRETACEAE.

Terminalia catappa, L.

Common on the shore, Pulau Adang, Rawi, etc.

Gyrocarpus Jacquinii, Roxb.

Pulau Tengah. Also collected on Pulau Badak, by Curtis.

This does not seem to occur south of this region, in the Peninsula, the leaves and fruits are quite glabrous. The *Gyrocarpus* on Christmas island differs not only in the remarkable appearance of the tree but in having the leaves and fruits pubescent.

BEGONIACEAE.

Begonia sinuata, Wall.

Rocks by the stream, Pulau Rawi.

Begonia, sp.

A plant with solitary ovate acuminate leaves, on Pulau Adang. I have not seen this species elsewhere.

SAMYDACEAE.

Homalium Griffithianum, Kurz.

Tree on the sea coast on rocks, Pulau Rawi. The same small-leaved form which I got at Perlis.

ARALIACEAE.

Heptapleurum venulosum, Seem.

Pulau Sarang and Pulau Adang.

RUBIACEAE.

Urophyllum glabrum, Griff.

Pulau Nipis. A form with shoots and leaves puberulous.

Heydyotis congesta, R. Br.

Pulau Rawi.

Randia exallata, Griff.

Pulau Rawi.

Distribution: Penang, Andamans and Burmah.

Randia fasciculata, De C.

Pulau Rawi.

Distribution: north of the Malay Peninsula.

Randia densiflora, Benth.

Pulau Rawi.

Catnium didymum, Gaertn.

Pulau Butong and Pulau Tengah.

Form with coriaceous leaves.

Prismatomeris albidiflora, Thw.

Pulau Butong.

Pavetta indica, L. var.

Pulau Adang.

Lxora multibracteata, Pears.

Pulau Adang.

Lxora Brunonis, Wall.

Pulau Adang.

Lxora stricta, Roxb.

Pulau Adang.

Psychotria stipulacea, Wall.

Common shrub in the woods. Pulau Rawi.

Lasiacanthus cyanocarpus, Jack.

Pulau Adang.

Webera adangensis, n. sp.

Shrub branches with white bark. Leaves variable in size ovate acuminate acute, base cuneate glabrous membranaceous drying black, nerves 6 pairs slender prominent on both sides, midrib grooved above $\frac{1}{4}$ to $\frac{1}{2}$ inches long $1\frac{1}{2}$ inch to 2 inches wide, petiole $\frac{1}{4}$ inch long. Stipules small connate ovate obtuse. Cyme terminal nearly sessile 1 inch long and somewhat wider, glabrous, branches spreading nearly an inch long or less. Bracts lanceolate acuminate $\frac{1}{2}$ inch long. Pedicels $\frac{1}{8}$ inch long with 2 minute ovate bracts. Calyx short $\frac{1}{16}$ inch long cup-shaped with 5 ovate lobes as long as the ovary. Corolla white $\frac{1}{4}$ inch long, tube rather thick cylindric twice as long as the calyx, with dense white hairs in the mouth, lobes oblong subobtuse, 5. Stamens exsert linear minutely mucronate. Style nearly as long or longer than the petals. Stigma cylindric clubbed, pubescent.

Pulau Adang.

Near *Webera Curtisii*, King, but with glabrous inflorescence and thinner leaves, and white stem.

Webera stellulata, Hook. fil.

Pulau Tengah and Rawi.

Webera longifolia, Hook. fil.

Pulau Tengah.

Webera insularis, n. sp.

Shrub, branches grey. Leaves thickly membranous glabrous, elliptic acuminate black and shining when dry, nerves prominent 5 to 6 pairs, 3 inches long by $1\frac{1}{2}$ inch wide; petiole rather slender $\frac{1}{4}$ inch long. Stipules lanceolate subulate $\frac{1}{8}$ inch long caducous. Cymes short 1 inch long rather compact quite glabrous, branches half an inch long. Bracts ovate acute, bracteoles lanceolate acute. Calyx $\frac{1}{10}$ inch long, tube subglobose, lobes longer lanceolate linear obtuse. Corolla tube cylindric twice as long as the calyx lobes, lobes lanceolate acuminate longer than the calyx tube $\frac{1}{8}$ inch long, mouth of tube hairy. Stamens linear minutely mucronate. Style hairy protruding for $\frac{1}{8}$ inch long. Stigma clubbed.

Pulau Nipis in sandy woods by the sea.

Nearest perhaps in some points to *W. Ridleyi*, Pears, differing from *W. Curtisii*, in its longer calyx lobes and glabrous inflorescence.

Ophiorrhiza fontinalis, n. sp.

Herb, 3 to 8 inches tall, stems usually solitary scurfy pubescent. Leaves lanceolate or ovate lanceolate thin shortly acuminate blunt, above sprinkled with short pustular hairs especially on the edge, beneath glaucous green, the nerves only scurfy pubescent. Stipules short truncate caducous. Peduncle $\frac{1}{2}$ -1 inch long scurfy pubescent. Cymes $\frac{1}{2}$ to $\frac{3}{4}$ inch long, branches three about six-flowered each. Calyx short $\frac{1}{10}$ inch long; lobes very short pubescent. Corolla white $\frac{1}{4}$ inch long; tube cylindric straight lobes lanceolate acute. Fruit transversely elliptic, tips rounded, margin straight not indented $\frac{1}{8}$ inch long $\frac{1}{10}$ inch deep.

Rawi island on rocks at the upper part of the stream. Lan-kawi, Telaya Tujoh near Burau on rocks in the stream.

It most resembles *O. tenella* but its narrow leaves and other points distinguish it.

O. Harrisiana, var.

Pulau Adang.

Distinct from typical *Harrisiana* in its much larger leaves and more woody stem. It is over a foot tall.

COMPOSITAE.

Wedelia biflora, De C.

A prostrate form with small heads of flowers in sand. Pulau Nipis.

GOODENOVIACEAE.

Scaevola Koenigii, Vahl.

Pulau Nipis.

SAPOTACEAE.

Sideroxylon ferrugineum, Hook.

Pulau Sarang and Pulau Adang.

EBENACEAE.

Maba buxifolia, Pers.

Pulau Sarang and Pulau Adang.

Diospyros flavicans, Hiern.

Pulau Rawi.

Diospyros Wallichii, King and Gamble.

Pulau Rawi and Pulau Adang.

APOCYNACEAE.

Holarrhena densiflora, Ridl.

In long grass on rocks on Pulau Rawi.

Distribution: Setul.

Ochrosia borbonica, Gmel.

Pulau Nipis.

ASCLEPIADEAE.

Marsdenia volubilis, Cooke.

Pulau Tengah.

Hoya parasitica, Wall.

On trees by the sea, Pulau Adang.

Dischidia nummularia, Br.

Pulau Butong.

Dischidia benghalensis, Colebr.

Pulau Rawi.

BORAGINEAE.

Cordia subcordata, Lam.

Pulau Butong.

Tournefortia argentea, L. f.

Pulau Nipis.

Distribution: Ceylon, Nicobars, Mauritius, Malay Islands, and Polynesia.

CONVOLVULACEAE.

Ipomaea campanulata, L.

Pulau Tengah in fruit only.

Ipomaea pes-caprae, Roth.

Pulau Nipis.

ACANTHACEAE.

Acanthus ilicifolius, L.

Pulau Rawi.

Eranthemum porphyranthos, Clarke.

Seashore in sandy spots. Pulau Butong, Pulau Adang and Pulau Tengah.

Gymnostachyum insulare, n. sp.

Herb about 2 feet tall, glabrous. Internodes long 3 inches. Leaves lanceolate acuminate at both ends, herbaceous, 7 nerved, 7 inches long $2\frac{1}{2}$ inches wide, petiole slender 1 inch long. Panicle lax, terminal, branches short to 2 inches long. Bracts linear acuminate $\frac{1}{20}$ inch long. Pedicels $\frac{1}{10}$ inch long, in flower, twice as long and thicker in fruit. Calyx lobes lanceolate acuminate as long as the corolla tube $\frac{1}{8}$ inch long. Corolla tube short and thick, little longer than the lobes, limb $\frac{1}{4}$ inch across pubescent. Upper lip bilobed with 2 equal oblong lobes rounded at the tip. Lower lip with 3 rounded lobes of which the centre is the widest. Stamens 2, filaments exsert. Anthers oblong 2-celled. Cells equal and parallel, no appendage. Style longer, stout, apex decurved. Capsule not flattened terete, an inch long borne on a thickened lengthened stem; the base of the calyx swollen globose. Sepals persistent retinacula, oblong with a rounded apex, yellowish flat, obscurely reticulate $\frac{1}{8}$ inch long.

Rawi island.

Allied to *G. magnum*, Clarke, of Tampin Hill in Malacca, differing in its lanceolate glabrous leaves, (those of *G. magnum* being scurfily pubescent in the midrib and nerves beneath.)

Justicia gendarusa, L.

Pulau Rawi.

Justicia inconspicua, n. sp.

A tall slender weeding straggling herb, internodes often as much as 3 inches long, nodes swollen, scurfy pubescent with appressed hairs. Leaves large lanceolate acuminate membranaceous.

ceous, acute, base cuneate, acquilateral or nearly so at the base, 5 inches long $1\frac{1}{2}$ inch across, nerves 7-8 pairs elevate beneath and inarching within the margin, glabrous, except the nerves which are pubescent. Small opposite leaf, ovate obovate $1\frac{1}{4}$ inch long, $\frac{3}{4}$ inch wide or less, petiole inch long. Cymes axillary subterminal 1 inch long. Peduncle slender half the length. Bracts minute linear subulate hairy. Calyx lobes linear setaceous $\frac{1}{10}$ inch long. Corolla half an inch long; tube as long as the calyx lobes, upper limb lanceolate narrow, lower limb broad widely 3-lobed, lobes oblong, laterals incurved, median broader, blunt, white. Lower lobe purple. Stamens exsert: anther cells brown, unequal, one above the other, appendage rather large, white, ending in a broad hook.

Rawi island in shady woods by the sea beach, (5899). Also collected in Pahang in 1891.

I took this for the imperfectly described *J. alternifolia*, Clarke, but that is described as having markedly unequal-sided leaves.

Peristrophe tinctoria, Nees.

Pulau Tengah. Apparently really wild here.

VERBENACEAE.

Premna trichostoma, Miq.

Pulau Adang.

Vitex pubescens, Vahl.

Pulau Rawi.

APETALAE.

NYCTAGINEAE.

Deeringia celosioides, R. Br.

Pulau Tengah.

LAURINEAE.

Cassyltha filiformis, L.

Pulau Nipis. A fasciated form.

Hernandia pellata, Meissn.

Pulau Butong.

EUPHORBIACEAE.

Euphorbia atoto, Forst.

Pulau Adang.

Cleistanthus trichocarpus, Ridl.

Pulau Rawi and Pulau Adang.

Breynia Keithii, Ridl.

Pulau Adang.

Aporosa aurea, Hook. fil.

Pulau Rawi.

Baccaurea lanceolata, Muell.

Pulau Rawi. Tree. Fruit bright red.

Antidesma Moritzii, Muell. Arg.

Pulau Rawi.

Gelonium bifarium, Roxb.

Pulau Adang.

Microdesmis casearifolia, Hook. fil.

Rawi island. A common tree.

Phyllanthus (Reidia) glaucifolia, n. sp.

Shrub with slender branches. Leaves ovate lanceolate acuminate acute; base rounded or very shortly narrowed; membranous above green beneath glaucous, more or less oblique, nerves fine inconspicuous 5 pairs, 4 inches long $1\frac{1}{2}$ inch wide, petiole $\frac{1}{10}$ inch long. Male flowers minute in numerous small clusters of racemes on the lower part of the branches below the leaves. Racemes $\frac{1}{10}$ inch long densely clad in ovate acuminate pink bracts on one side. Pedicels hair-like pink. Perianth rose pink, lobes 4 oblong fimbriate. Stamens 4 connate truncate. Female flowers on the leafless ends of the branches solitary in the axils of two lanceolate acuminate bracts. Pedicels $1\frac{1}{4}$ inch long filiform. Perianth lobes $\frac{1}{8}$ inch long triangular lanceolate green fimbriate. Capsule smooth pale green half an inch long.

Rawi island by the banks of the stream.

The smooth grey backs of the leaves gives this plant a striking appearance. The little racemes with their dense mass of closely appressed bracts are also curious.

URTICACEAE.

Phyllochlamys Wallichii, King.

Pulau Tengah, forming much of the undergrowth. A small-leaved form on Pulau Nipis.

Balanostreblus ilicifolius, Kurz.

Pulau Adang.

Ficus parietalis, Bl.

River, Pulau Rawi.

Ficus globosa, Bl.

Rocks. Pulau Adang.

Ficus retusa, L.

Pulau Rawi.

Ficus sarophila, Bl.

Pulau Rawi. More hairy on the stalks than usual.

CASUARINEAE.

Casuarina equisetifolia, Forst.

Seashore, Pulau Adang and Pulau Nipis.

GNETACEAE.

Gnetum macrostachum, Hook. fil.

Pulau Adang.

CYCADACEAE.

Cycas Rumphii, Miq.

Pulau Butong and Pulau Rawi, attaining a height of 20 feet.

MONOCOTYLEDONES.

ORCHIDEAE.

Dendrobium eulophotum, Lindl.

Pulau Rawi. Common all over the Malay Peninsula.

Dendrobium lamellatum, Lindl.

Pulau Rawi.

Dendrobium secundum, Lindl.

Pulau Nipis.

Bulbophyllum macranthum, Lindl.

Pulau Rawi, on a tree across the river. Also at Telayah Tujoh, Lankawi. Common all over the Peninsula.

Calanthe vestita, Lindl.

Plants of what appeared to be this found on a fallen bough on Pulau Nipis.

Eulophia Keithii, Ridl.

Pulau Butong.

Distribution: Siam as far south as Alor Star.

Geodorum purpureum, Br.

Seashore in Pulau Rawi.

Luisia brachystachys, Bl.

Rocks on Pulau Rawi.

Saccolabium miserum, Ridl.

Common on rocks at Pulau Rawi.

Podochilus lucescens, Bl.

On trunks of trees, Pulau Rawi.

Corymbis veratrifolia, Thuar.

Woods, Pulau Rawi.

Pogonia flabelliformis, Lindl.

Sandy woods at Pulau Nipis.

SCITAMINEAE.

Elettariopsis pubescens, Ridl.

River bank on Pulau Rawi. Also on the track to Telayah Tujoh, Lankawi.

Musa Malaccensis, Ridl.

Pulau Tengah. Abundant in the upper part of the island.

TACCACEAE.

Tacca cristata, var *minor*.

A very small form. Woods, Pulau Rawi.

AMARYLLIDAE.

Curculigo latifolia, Dryand.

Woods on top of the hill, Pulau Adang.

ROXBURGHACEAE.

Stemona tuberosa, Lour.

Seashores at Rawi.

Distribution: Siam and Cochin China to the Dindings and Pahang.

LILIACEAE.

Peliosanthes parviflora, n. sp.

Leaves lanceolate acuminate at both ends, acute 10 nerved, base decurrent to the petiole 7 inches long $2\frac{1}{4}$ inches wide, petiole 6 inches long. Scapes 4 inches long covered to the base with lanceolate acuminate papery bracts the lower ones $\frac{1}{4}$ inch long. Flower solitary or two in the axils. Pedicel about as long as the bract. Perianth tube shorter than the lobes, limb $\frac{3}{16}$ inch across, lobes oblong ovate obtuse blue green. Staminal ring fleshy elevated

above the mouth of the perianth tube, attached to the ovary only at the base. Stamens subglobose white bilobed. Ovary half inferior. Style stout free, stigma capitate.

Rawi island, in fruits, April 1911.

Nearest perhaps to *P. stellaris* but with larger leaves, stamens completely connate and flower smaller with broader blunter perianth lobes. One specimen has the inflorescence bifurcating.

Dracaena aurantiaca, Wall.

A very large form attaining a height of about feet and much branched, in fruit Pulau .

Dracaena congesta, Ridl.

Pulau Tengah.

PALMAE.

Areca triandra, Roxb.

Woods on Rawi island.

Pinanga adangensis, n. sp.

A tall palm making large clumps, stems 23 feet tall $1\frac{1}{2}$ inch through, stout yellowish tinted red. Leaves 5 feet long, leaflets linear acuminate with a broad decurrent base 20 inches long 1 inch wide, apical pair connate at base toothed, 8 inches long and 2 inches wide; not glaucous beneath. Spathe from below the leaves oblong 7 inches long 3 inches wide edges keeled. Spadix six-branched the largest branch 7 inches long; rachis flexuous hardly flattened $\frac{1}{8}$ inch thick. Flowers distichous. Male flowers, calyx very small, sepals ovate. Petals triangular ovate cuspidate falcate $\frac{1}{4}$ inch long. Stamens 20, filaments very short. Anthers oblong obtuse. Female flower sepals and petals orbicular ovate acute, subequal. Fruit (unripe) obovoid half an inch long slightly narrowed at the base.

In wet swampy woods on Pulau Rawi.

Near *Pinanga malaiana*, Scheff., but the rachis of the spadix is much more slender, and flattened, and the female flowers are smaller.

Oncosperma filamentosa, Bl.

Woods on Pulau Rawi.

Caryota mitis, Lour.

Pulau Rawi.

Licuala spinosa, Roxb.

Pulau Rawi.

AROIDEAE.

Arisaema Kunstleri, King.

On rocks, Pulau Adang.

Amorphophallus viridis, n. sp.

Tuber elongate cylindrical. Leaf petiole 9 inches tall green, lamina about 18 inches across, leaflets elliptic, rather abruptly acuminate acute, decurrent below, 4 inches long, 1 inch wide, about 4 pinnae to the lamina. Peduncle 12 inches tall. Spathe 4-6 inches long apple green, cleft nearly to the base, limb oblong rounded at the tip 4-5 inches long, 1 inch wide. Spadix shorter. Appendage slender cylindric obtuse 3 inches long, creamy white: male portion $\frac{3}{4}$ inch long, flowers small irregular cream-coloured with a wavy violet margin. Female flowers about 20 yellow. Drupes 1-2 seeded oblong or subglobose $\frac{1}{4}$ inch long, red. Seed ovoid or subcordate.

Pulau Tengah. In loose screes of fallen dusty clay, and also on the seashore.

Near *A. variabilis*, Bl., but the oblong green spathe limb distinguishes it.

Colocasia gigantea, Hook. fil.

Woods, Pulau Rawi.

CYPERACEAE.

Fimbristylis asperrima, Vahl.

Pulau Rawi on rocks overlooking the sea the typical form, and also another form with very narrow grassy leaves.

Common all over the Peninsula.

Mapania tenuiscapa, Clarke.

Pulau Rawi woods far up the stream.

Remirea maritima, L.

Seashore at Pulau Adang.

Scleria lithosperma, Willd.

Pulau Butong.

Carex indica, L.

Pulau Rawi, rocky woods by the sea.

GRAMINEAE.

Panicum latifolium, Sw.

Pulau Rawi.

Oplismenus compositus, Beauv.

Dry woods, Pulau Adang.

Ischaemum muticum, L.

Seashore, Pulau Nipis.

Andropogon, sp.

Habit of *A. nardus* and faintly scented. No flowers seen the inflorescence being replaced by branches of leaves. Very abundant on the rocky slopes in the small bay of Pulau Rawi.

Thuarea sarmentosa, Pers.

Seashores, Pulau Adang and Pulau Nipis.

Schizostachyum insulare, n. sp.

Stems about 3 inches through, 20-40 feet tall. Leaves lanceolate acuminate with a long point; margins of the denticulate base narrowed cuneate, 12 inches long $1\frac{1}{2}$ inch wide, petiole channelled $\frac{1}{4}$ inch long. Sheaths ribbed, ligule, of long bristles $\frac{1}{4}$ inch long. Inflorescence over a foot long of 5 or 6 spikelets crowded with tufts; tufts an inch apart, with lanceolate bracts at the base, half an inch long and $\frac{1}{4}$ inch wide. Spikelets an inch long. Empty glumes at base 2:—I, ovate keeled mucronate $\frac{1}{2}$ inch; II, lanceolate keeled mucronate, margins at the top bristly $\frac{1}{4}$ inch; III, elongate lanceolate mucronate very bristly at the tip; IV, elongate narrow lanceolate, apex slightly bristly. Palea lanceolate convolute. Filaments slender connate. Anthers linear long, not penicillate 4. Ovary narrow subcylindric. Lodicules oblong with a rounded tip, brown pubescent.

Pulau Rawi.

Near *S. latifolium* but the leaves are thinner, and narrowed to base, the filaments connate, anthers 4.

Schizostachyum dumosum, n. sp.

A slender erect bamboo, with hollow stems $\frac{1}{8}$ inch or more through; internodes over 6 inches long smooth. Leaves lanceolate acuminate, base broad, slightly narrowed at the extreme base 6 inches long, $\frac{3}{4}$ to 1 inch long, margins scabrid, petiole $\frac{1}{10}$ inch long, ligule none, a black edge to the sheath only marking it. Inflorescence terminal 2 feet long, slender, with tufts of slender branches 6 inches long or less from the nodes. Spikelets in tufts about half an inch long, crowded. Bracts papery ovate about $\frac{1}{8}$ inch long. Spikelet $\frac{1}{4}$ inch long $\frac{1}{10}$ inch through acuminate. Glume I:—ovate minutely cuspidate 4 ribbed. Glume II:—ovate lanceolate 6 ribbed half as long again. Glume III:—longer lanceolate. Glume IV:—elongate lanceolate distinctly cuspidate. Flowering glume 1 paleaceous. Stamens 3. Filaments connate. Anthers brown dehiscing only at the top, ovary beaked with a long conic acuminate beak, hairy. Style filiform red brown. Stigmas purple feathery fairly long.

Rawi island on a dry rock, face of the island forming dense thickets, the stems usually short 6 or 7 feet but sometimes much longer.

FILICES.

Trichomanes javanicum, Bl.

Pulau Rawi and Pulau Butong.

Trichomanes parvulum, Poi.

Not in fruit. Pulau Adang.

Davallia solida, Sw.

Pulau Adang.

Adeantum Capillus-veneris, L.

Pulau Rawi, Pulau Butong and Pulau Tengah.

Aspidium polymorphum, Wall.

Pulau Rawi.

Nephrodium pteroides, Retz.

Pulau Adang.

Pleopeltis phymatodes, L.

Pulau Tengah.

Pleopeltis sinuosa, Wall.

Pulau Rawi.

Niphobolus adnascens, Sw.

Pulau Adang and Pulau Tengah.

Drynaria quercifolia, L.

Pulau Adang.

Vittaria elongata, Sw.

Pulau Adang.

Vittaria lineata, Sw.

Pulau Rawi.

Antrophyum reticulatum, Kaulf.

Pulau Rawi.

Gymnapteris contaminans, Wall.

Pulau Adang.

Polybotrya appendiculata, Willd.

Pulau Rawi.

LYCOPODIACEAE.

Selaginella pinangensis, Spring.

Rocks, by the River Rawi.

Selaginella, sp.